COMPUTER ENGINEERING: MACHINE LEARNING AND DATA SCIENCE, BS

The Machine Learning and Data Science option in Computer Engineering prepares students for a career in computer engineering with an emphasis on machine learning and data science. The purpose of this option is to provide guidance and recognition for students pursuing this career path. The option uses 19 of the elective credits within the 120-credit Computer Engineering BS degree program to focus on the mathematics, tools, and practices associated with machine learning and data science in engineering. Students selecting this option must submit an option declaration form to the dean's office in Engineering Hall.

REQUIREMENTS

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MACHINE LEARNING AND DATA SCIENCE REQUIRED COURSES

Code	Title	Credits
E C E 204	Data Science & Engineering [1]	3
E C E 331	Introduction to Random Signal Analysis and Statistics (typically offered fall) [2]	3
E C E/COMP SCI/ M E 532	Matrix Methods in Machine Learning [1]	3
E C E/COMP SCI/ M E 539	Introduction to Artificial Neural Networks [3]	3
COMP SCI 564	Database Management Systems: Design and Implementation [4]	4
Total Credits		**16**

[1] This course can be taken as a Professional Elective.
[2] This course fulfills the Probability requirement.
[3] This course can be taken as a CMPE Elective II.
[4] This course fulfills the System Software Requirement.

MACHINE LEARNING AND DATA SCIENCE ELECTIVE

Code	Title	Credits
Choose one as an Advanced, Professional, or Free Elective:		3-4
E C E 431	Digital Signal Processing (typically offered fall) [1]	
E C E/COMP SCI/ I SY E 524	Introduction to Optimization [1]	
E C E/ COMP SCI 533	Image Processing (typically offered fall) [1]	
E C E/ COMP SCI 561	Probability and Information Theory in Machine Learning (typically offered fall)	
E C E/I SY E 570	Ethics of Data for Engineers	
COMP SCI/I SY E/ MATH/STAT 525	Linear Optimization [1]	
COMP SCI 540	Introduction to Artificial Intelligence	
COMP SCI/ B M I 567	Medical Image Analysis [1]	
COMP SCI/ B M I 576	Introduction to Bioinformatics	
COMP SCI 577	Introduction to Algorithms	
I SY E 412	Fundamentals of Industrial Data Analytics	
I SY E 521	Machine Learning in Action for Industrial Engineers	
L I S 461	Data and Algorithms: Ethics and Policy	
MATH/I SY E/ OTM/STAT 632	Introduction to Stochastic Processes [1]	
MATH 635	An Introduction to Brownian Motion and Stochastic Calculus [1]	
M S & E 460	Introduction to Computational Materials Science and Engineering [1]	
STAT 421	Applied Categorical Data Analysis [1]	
STAT/M E 424	Statistical Experimental Design [1]	
STAT 456	Applied Multivariate Analysis [1]	
STAT 461	Financial Statistics [1]	

[1] This course has additional requisites not required for the BS in Computer Engineering.

FOUR-YEAR PLAN

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SAMPLE FOUR-YEAR PLAN

First Year

Fall	Credits	Spring	Credits
MATH 221	5	MATH 222	4
E C E/COMP SCI 252	3	PHYSICS 201	5
or Communications A		E C E 204	3
CHEM 103	4	Communications A or	3
Liberal Studies Elective	3	E C E/COMP SCI 252	
	15		**15**

Second Year

Fall	Credits	Spring	Credits
E C E 203	3	MATH/COMP SCI 240	3
E C E 210	2	E C E 222	4
E C E/COMP SCI 352	3	E C E 230	4
MATH 234	4	E C E 270	1
PHYSICS 202	5	COMP SCI 300	3
	17		**15**

Third Year

Fall	Credits	Spring	Credits
E C E 353	3	E C E 315	1

E C E 340	3	E C E 551	3
E C E 331	3	Circuits Elective	3
E C E/COMP SCI 354	3	INTEREGR 397	3
COMP SCI 400	3	Liberal Studies Elective	3
		Liberal Studies Elective	3
	15		**16**

Fourth Year

Fall	**Credits**	**Spring**	**Credits**
E C E/COMP SCI/ M E 532	3	COMP SCI 564	4
E C E 453, 454, 455, or 554	4	E C E/COMP SCI/ M E 539	3
Computer Engineering Elective	3	Machine Learning and Data Science Elective	3
Liberal Studies Elective	3	Liberal Studies Elective	3
		Free Elective	1
	13		**14**

Total Credits 120